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ABSTRACT

A roundtable on Appropriate Technology (AT) was sponsored by the American Association of Community and Junior Colleges (AACJC) and supported by the National Science Foundation (NSF) as a result of a mandate from Congress to develop an AT program. The roundtable report first discusses the role of the NSF in including community colleges in the project, strengthening the scientific base of AT, improving understanding of AT as a science and technology concept, and funding relevant research. Two papers presented at the roundtable follow. The first provides: (1) a definition of AT, demonstrating its small scale, localized approach to the provision of basic needs with minimum demands upon the environment: (2) profiles of AT supporter groups, including back-to-the-land enthusiasts and low-income groups faced with rising energy costs: (3) a rationale for community college involvement in AT that stresses the parallels between the two in local orientation and pragmatism: (4) a discussion of AT activities that community colleges can sponsor: and (5) a comment on the potential role of the AACJC in AT. The second paper outlines roundtable recommendations for the involvement of community colleges and the AACJC in AT. The report concludes with additional observations pointing to current community college activities, including the alcohol fuel development program at Colby Community College. (J)

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COMMUNITY COLLEGES AND APPROPRIATE TECHNOLOGY

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INTRODUCTION

Is there a role for community colleges in appropriate technology? If so, is it an informational or instructional role? Or is it that of a catalyst for action?

These are some of the questions that were raised at a roundtable on appropriate technology sponsored by the American Association of Community and Junior Colleges July 19-20, 1979, in Washington, D.C. The participants in the roundtable included representatives of community colleges and appropriate technology groups whose names are listed at the close of this report. The roundtable was supported by the National Science Foundation as a result of a mandate from Congress to develop a program in appropriate technology for implementation in Fiscal Year 1980. The resulting program plan calls for participation of community colleges and other groups outside the traditional NSF performer community:

> It is evident that many of the performers who would be interested in support of an NSF appropriate technology program are outside the mainstream of NSF's present performing community. These new performers would include smaller, community oriented colleges, small businesses, individual innovators and community groups with interest in appropriate technology.*

*Appropriate Technology, A Program Plan of the National Science Foundation, prepared for the Committee on Science and Technology, US House of Representatives, by the Office of Problem Analysis, Directorate for Applied Science and Research Applications, National Science Foundation, February 1979.

The National Science Foundation will use the information gathered in the roundtable to guide the operation of the program so that it is compatible with the goals of community and junior colleges.

The goals of the Appropriate Technology program of the newly created Directorate for Engineering and Applied Science of the National Science Foundation are:

(1) to strengthen the science base needed to identify and develop promising appropriate technologies which have the potential for generalization beyond the initial application and which fall outside the responsibility or interest of mission agencies;

(2) to improve the understanding of appropriate technology as a concept in the development of science and technology and to better understand its role and impact on U.S. society and economy.

The Directorate for Engineering and Applied Science plans to implement these goals by supporting research projects which will contribute to the science base of promising technologies or to the understanding of appropriate technology and its role in society. The Directorate is also interested in supporting and evaluating innovative means to link the various groups working in appropriate technology research so that they may better complement each other and strengthen appropriate technology. These groups would include appropriate technology innovators, university

researchers, community-based educational institutions, small businesses, community groups, and state and local governments.

The NSF Directorate for Science Education will also support activities related to appropriate technology. Their role in support of appropriate technology has been augmented by Congress for Fiscal Year 1980. They will support projects in all of their programs but the two most relevant are:

(1) The Office of Science and Society, which supports projects to increase the public's understanding of science and technology and the roles these play in meeting national needs, to increase the understanding of the relations between ethical and human values of society and scientific activities and to improve the availability of scientific knowledge to the public.

(2) The Division of Science Education Development and Research, which emphasizes activities to develop new knowledge and new means for improving science education at all levels. Programs range from basic research in selected areas of science education to the development of specific instructional materials, technologies, and methods. Innovation, transferability, and potential for national impact characterize development projects supported by this Division.*

*See Guide to Science Education Program, Fiscal Year 1980, National Science Foundation, SE80-1. July 1979.

To prepare for the roundtable, the Association obtained the services of David Goldberg, an advocate and planner of appropriate technology. He prepared a background paper on appropriate technology and the possible role of community colleges in that field. Dr. Goldberg also participated in the meeting and provided a report on its outcomes and recommendations. The two papers--both of which deal in some detail with the meaning and importance of appropriate technology--make up the substance of this report.

The American Association of Community and Junior Colleges and the National Science Foundation are indebted to the participants in the roundtable for their provocative deliberations and final recommendations. They were positive and encouraging. They made an important contribution to advancement of community college education on still another emerging front.

APPROPRIATE TECHNOLOGY AND COMMUNITY COLLEGES

(Background Paper)*

David H. Goldberg

I. DEFINITION AND OVERVIEW

There has been growing interest in recent years, both in the U.S. and abroad, in what is variously referred to as "appropriate," "alternate," "intermediate," "small-scale," "light-capital" and "neighborhood" technology. While each has a somewhat different emphasis, the terms are often used interchangeably. Unfortunately, there is no universally agreed upon definition of any of them. In addition, they are sometimes applied to discrete pieces of "hardware," e.g., a wood stove, small wind machine, cider press, thermal window shutter, and at other times to "software," e.g., processes, systems or organizations such as community gardens, composting, home retrofits or worker-owned enterprises.

A. Definitions

In this paper appropriate technology (AT) is meant to cover all of the above terms. A piece of AT hardware will be defined as a technology which tends to have all or most of the following characteristics:

- is efficient in its use of energy and other resources
- is simple to install, operate and maintain
- satisfies local needs

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*The paper draws, in part, on an earlier paper, Defining Appropriate Technology, prepared by the author for the NSF Northeast Regional Appropriate Technology Forum. The views expressed are those of the author alone and do not necessarily reflect those of AACJC or NSF.

- increases community self-reliance
- is environmentally sound
- results in durable recyclable systems and/or products
- conserves nonrenewable resources
- maximizes use of local materials and labor skills
- is suitable for use in decentralized applications

An AT system will include many of the above characteristics and will generally entail:

- democratic decision making
- a fair distribution of any profits
- local control
- accessibility for all potential participants, including low and fixed income people
- improvement in "quality of life" (as defined by residents/users/participants)
- creating or preserving meaningful jobs

B. Constituents*

In the U.S., environmentalists and conservationists were among the early supporters of AT. They saw growth, mechanization and high technology making increasing demands on our natural resources--land, water, air, forests, fuels and minerals--both through depletion and pollution. Smaller scale, localized appropriate technologies appealed to them as a way of providing for our basic needs while making minimal demands on our environment.

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*This discussion draws, in part, on "Issues in Appropriate Technology," an earlier paper prepared by Ann Becker for the National Science Foundation.

The back-to-the-land movement of the early '70's spurred a more pragmatic interest in AT. Having fled the cities and opted for a simpler, more self-reliant and ecologically valid life-style, many folks discovered their dependence on appropriate tools, e.g., woodstoves, chain saws, log splitters, rototillers, and incubators, as well as appropriate support systems, e.g., food co-ops, tool sharing collectives, bulk seed buying, community health centers, owner-built home information.

Meanwhile, welfare payments for low-income people were falling behind rising living costs in general and food, energy and housing costs in particular. This led CSA, FEA, HUD and other Federal agencies to support programs, e.g., home weatherization, community development corporations, sweat equity housing, inner city food co-ops, solar greenhouses, aimed at increased self-reliance for low/fixed-income people. This trend culminated in CSA's creation of the National Center for Appropriate Technology whose mandate is to explore, develop, demonstrate, and evaluate the applicability of appropriate technology to the needs of low-income people.

There is also some support for AT among those people who favor local control, community economic development and/or community self-reliance. They see community viability threatened by a variety of factors, including the growing power of big government and big business, rising energy costs, and urban sprawl. AT is seen by some as holding out the promise for stabilizing local economies, reducing living costs, allowing wiser use of local resources, and/or regaining control of basic needs and life-support systems.

The rationale for promoting AT in other developed countries parallels that in the U.S., while the primary focus in less developed countries (LDC's) is on AT's role in economic development. As pointed out by E. F. Schumacher and others, conventional development strategies emphasizing the export of Western high technology and measures of Gross National Product have not worked well in LDC's. A number of students of the international scene are now calling for "alternative development strategies" which emphasize (1) provision of basic goods and necessities and (2) the proliferation of small, local economic enterprises which serve local markets, use local resources and are labor rather than capital intensive.

In summary, appropriate technology is seen by a wide variety of groups as having the potential for meeting an equally wide variety of emerging needs and priorities. That is not to say that AT is the panacea for the world's ills. Individual pieces of hardware may prove ineffective, inefficient, or have unanticipated side effects. And in many cases large-scale, centralized "high" technology will continue to be preferred for a variety of reasons, e.g., cost-effectiveness, existing infrastructure, and capital investment, convenience or reliability. However, AT's promise is sufficiently great to merit a significantly expanded program of training, research, development, exploration and evaluation.

And it is important that this country's community and junior colleges play a role in this effort.

II. A RATIONALE FOR COMMUNITY COLLEGE INVOLVEMENT IN APPROPRIATE TECHNOLOGY

A. Local Orientation

As can be seen from the above definition, AT places a high priority on local needs, resources, skills and benefits. Because of their strong community base, community colleges are in an ideal position to capitalize on this local orientation. Unlike most of their colleagues in four-year institutions, community college faculty and administrators are in touch with their local communities. In many cases, their students are drawn from nearby secondary schools and industries; their vocational courses are geared to local employment opportunities; they are in daily touch with a host of relevant local agencies, organizations and institutions. Equally important, they are often financially supported by their host community and, therefore, responsive to its needs. For example, one survey showed that 65% of the colleges contacted were governed by local boards.

B. Pragmatism, Flexibility, and Credibility

AT places heavy emphasis on practicality, on developing and employing useful tools to do constructive work. Many community college curricula also stress practical applications, skills training, and provision of services. In both cases theory is held to a minimum and simplicity is usually valued over complexity.

Community colleges, being closer to their roots, are often more flexible and responsive than larger and more bureaucratic

institutions. Since there is more opportunity for face-to-face discussion and simpler decision-making processes, they are more likely to adapt new and innovative programs. And, lastly, they are credible institutions. The adaptation of new, novel or unique technologies, skills or processes will be greatly enhanced if they are sponsored by such a respected local institution.

III. POTENTIAL ROLES, SERVICES, AND ACTIVITIES OF COMMUNITY AND JUNIOR COLLEGES IN APPROPRIATE TECHNOLOGY

While the purpose of this paper is to suggest new avenues for community college involvement in AT, we should not lose sight of the fact that a number of colleges have already launched programs in AT and related areas. A recent survey by Dr. Bette Everett Hamilton of AACJC showed that 26% of the two-year colleges responding offered energy conservation courses or workshops and 32% had solar offerings.*

For example, Richard O'Donnell, currently director of the Northern New England Center for Appropriate Technology, was previously on the faculty of the New Hampshire Vocational Technical College where he was instrumental in launching the Solar Heated and Energy Design Shelters project. And Navarro College in Corsicana, Texas has initiated a two-year Solar Energy Technician Curriculum** which includes the following courses:

*A Survey of Energy Programs in Two-Year Colleges, AACJC, December, 1978.

**From "A National Project in Energy and Appropriate Technology" by Tom Hébert, Education Consultant to the National Center for Appropriate Technology.

FIRST SEMESTER
Math I
Energy Science I
Intro. to Solar Energy (Conservation & Passive Design)
Materials and Material Handling
Engineering Drawing
Education & Career Planning

SECOND SEMESTER
Math II
Energy Science II
Collectors & Energy Storage
Heat, Ventilation, & Air Conditioning
English

THIRD SEMESTER
Applied Electric Circuits & Instruments
Sizing Design & Retrofit
Tech. Survey of Energy Sources
Intro. to Computers & Programming
Introduction to Business

FOURTH SEMESTER
Operational Diagnosis
Codes, Legal, Econ., Consumerism
General Psychology, Human Relations
Non-residential Applications & Future Technology
Technical Report Writing
Solar Practicum

In addition, numerous colleges have sponsored fairs, hosted conferences, conducted workshops, and implemented conservation measures.

Our intention below is to briefly list some of these and other potential avenues for community college involvement in AT. The listing is neither detailed nor exhaustive but is intended as a starting point for roundtable participants.

A. Job Training

The most obvious role for community colleges is to provide training for the many new jobs which are likely to emerge in the

AT field. There will be a need for solar technicians to size, fabricate, install, monitor, and/or maintain active solar systems for space and water heating. Energy auditors are needed to determine heat loss in residential and commercial buildings and to recommend energy conservation techniques and practices. Small farm managers will be needed who are versed in low-energy agricultural practices, including conservation technologies and techniques for generating energy from renewable resources in rural settings.

An increasing number of regions, states, cities and communities are conducting inventories of their total renewable energy potential (one sign of this growing interest is the upcoming First Annual Conference On Community Scale, Renewable Energy Systems scheduled for August 20-22 in Boulder, Colo.). Such studies will require a large pool of broadly trained individuals.

It is currently planned to expand the pilot Energy Extension Service to all 50 states and this will require a large number of energy educators and outreach workers. As future home buyers and home builders become more energy conscious they will be looking for building tradespeople trained in the latest design and construction techniques (e.g., Trombe walls, thermal curtains, solar greenhouses, grey water usage, 2 x 6 stud walls).

One approach to the above needs has been proposed by Dr. Laurence Kinney, formerly with the Educational Policy Research Center and currently with the Energy Research Center, Syracuse

Research Corporation. He has suggested a more heavily theoretical Energy Studies and Appropriate Technology curriculum which would include the following courses:

Introduction to Energy Studies and Appropriate Technology (Two semesters, Four credits per semester, lab/theory)

Energy and Ecology (Three credits, lab/theory)

Technology of Pollution Monitoring (Three credits, lab/theory)

Remedial Architecture (Two semesters, Three credits per semester, lab/theory)

Landscaping for Energy (One credit, lab/theory)

Lighting (Three credits, lab/theory)

Courses in Individual Forms of Energy (Credit depends on availability of knowledge sufficient to teach employable skills, lab/theory)

Courses in Forms of Energy Storage and Distribution (Credit: same test as above, lab/theory)

Design, Installation and Maintenance of Community, Farm and Residential Energy Systems (Three credits, lab/theory)

History of Technology (Three credits, theory)

Technology and Value Theory (Three credits, theory)

Technology and Community I and II (Three credits per semester, theory)

Economics, Energy, and Employment (Three credits, theory)

Consumer Education and Motivation (Three credits, theory)

Energy, Ecology, and Equity (Three credits, theory)

More Humane Futures (Three credits, theory)

B. Hands-On Workshops

With both energy and labor costs on the rise many people are turning to do-it-yourself projects. There are many project plans, designs and process descriptions available but many people would like some actual hands-on training before embarking on a project. They could get this in two-day to two-week workshops in such areas as solar greenhouse design and construction, organic gardening, food preservation, home insulation, solar hot water kit construction, greenhouse gardening, composting, and low-energy recreation.

C. Public Education

Community colleges have traditionally fulfilled a public or community education function through a host of mechanisms that go beyond the typical classroom format. These include hosting conferences, meetings, fairs, exhibits, film festivals, and dramatic performances. The content is usually determined by the interests of the day, i.e., "the market."

Because of the increasing publicity devoted to energy, self-reliance, and community development, there is a growing market for AT-related events. This is amply demonstrated by the large turnouts to such diverse events as the Vermont Tomorrow/Community College of Vermont series on Wind, Wood, Water and Sun; the University of Massachusetts Toward Tomorrow Fair; AERO's New Western Energy Show; and ACT '79 which was recently held on the Mall in Washington.

Community colleges should review the degree of interest in their own service area and provide appropriate educational opportunities.

D. Resource Centers

Most of the above activities are limited by time constraints and will not necessarily be available when they might be most needed. One alternative is to create an AT Resource Center open year in and year out to respond to the needs of both the college population and the community. Depending on financial and resource contraints its services/activities might include providing technical assistance on-site and/or by telephone, distributing written materials, faculty retraining, lending tools or books, showing films, hosting workshops, conducting research, testing new technologies.

The notion of Community Resource Centers was pioneered by the National Self-Help Resource Center (NSHRC) which has worked with communities across the country. Most of these CRC's provide access for local residents to a diverse body of information

ranging from health care to housing and food stamps to crime control. NSHRC in collaboration with AACJC is currently assisting six community colleges to set up six more narrowly focused CRC's. Thus there is ample prior experience that could be brought to bear on the development of AT Resource Centers.

E. Demonstration Sites

"Seeing is believing," and some people like to see a new idea, technique or technology tried out in their own locality before they will consider adopting it themselves. In addition, many colleges which are themselves feeling the pinch of reduced budgets, inflation, and rising food and energy costs are looking for solutions to their own problems. For example, one mid-western community college reported that its fuel bill for the month of January went from $2,000 in 1970 to $12,000 in 1977, despite a 14% reduction in energy consumed!

These two forces lead naturally to the idea of colleges adapting some appropriate technologies to meet their own needs and involving local residents in the process. These could include converting to wood heat, integrated pest management, installation of thermal curtains, building passive solar collectors, growing and preserving food locally, recycling waste.

F. Research

Community colleges have not historically been responsible for conducting basic or applied research. But AT lends itself to such a prospect because of its more modest requirement for

equipment, capital and scientific expertise. Many community colleges would be well suited for such projects as design modification, field testing, needs assessments, and market research. In fact, because of their lower overheads and access to local sites and resources they would be preferable to most high powered universities and research institutes.

G. AT Entrepreneurship

Much of the above applies to job seekers and do-it-yourselfers, but there is a growing segment of the student population that is comprised of people who want to set up their own business, be responsible for their own livelihood. This market is not being well served by schools of business and engineering that are primarily geared toward producing employees for large corporations.

New curricula could be developed that included both (1) a general background in small business management, finance, marketing, etc. as well as (2) a specific technical focus, e.g., small farm management, home energy conservation, waste recycling or renewable energy technology. There is a wealth of new materials to support such curricula--both general purpose publications such as Venture: The Magazine for Entrepreneurs, Small-Time Operator, and Working for Yourself and AT related publications such as The Institute for Local Self-Reliance's Starting Your Own Energy Business and Jerry Goldstein's (formerly of Rodale Press) bi-monthly In Business.

IV. POTENTIAL ROLE OF AACJC

AACJC is a national non-profit organization that represents approximately 900 public and private community and junior colleges. In partial fulfillment of its mission to "alert member institutions to trends and issues in society which present significant opportunities or constraints," it has created a number of special purpose programs. Some of these deal with the needs and opportunities of women, older Americans and veterans; others are aimed at life-long learning and still others deal with college management issues.

Of special relevance to this paper is AACJC's current National Issues Forum: Energy and the Way We Live; its Energy Information Clearinghouse, and its on-going work with labor unions on such issues as journeyman retraining, apprenticeship degrees, and community education/work councils.

Because of its central role in community college development, the Association might consider the establishment of a clearinghouse on appropriate technology. Such a clearinghouse could play a vital, catalytic role in bringing about many of the activities suggested above through networking, hosting workshops, producing a newsletter on AT education, advising on curriculum development and evaluation, producing annotated bibliographies and resource guides, publicizing exemplary programs, and serving as liaison with relevant non-profit groups and Federal agencies. Such a clearinghouse could also either undertake or assist in some of the tasks described below.

V. POTENTIAL ROLE OF OTHER AT AND EDUCATIONAL ORGANIZATIONS

Recent studies by AACJC, the National Center for Appropriate Technology (NCAT) and the Center For Renewable Resources (CRR) have turned up several needs that will have to be met before there is any widespread initiation of AT programs in community colleges:

- The Hamilton survey cited earlier found that 52% of the respondents indicated a need for more "issue awareness on campus by faculty, administrators, and students before new energy-related programs would even be considered." Thus, a concerted national effort should be made to apprise college communities of (1) the nature of the energy crisis, (2) the prospect of its partial alleviation through an AT approach, and (3) the specific actions that can be taken by colleges to foster this approach.
- In addition, 67% of the respondents indicated that relevant curricular materials were needed before course content could be determined. In a similar vein, CRR has found a variety of materials available for solar education but no curricular units. A large-scale, multi-year effort could be launched to (1) survey, collect and annotate relevant materials, (2) produce new instructional materials and units, and (3) field test and evaluate these units in several colleges across the country.

- It is imperative that competent faculty members be retained to teach AT courses. Colleges could be assisted in locating local AT practitioners available on a part-time basis and summer faculty institutes could be held to train staff currently serving on HVAC, engineering, building trades, agricultural, business and related faculties.

David Goldberg is president of Program Planning/Development Associates, a small consulting firm based in Montpelier, Vermont, specializing in appropriate technology and renewable resources. Dr. Goldberg was formerly advanced planning officer for the Bureau of Research and acting branch chief, Organization and Administration Studies, Division of Higher Education, U.S. Office of Education. His recent work has included projects for NSF, TVA, the U.S. Department of Energy, Solar Energy Research Institute, Vermont Energy Office, Center for Energy Policy and others.

SUMMARY REPORT
AACJC ROUNDTABLE ON APPROPRIATE TECHNOLOGY

David H. Goldberg

The following is a brief report on a meeting hosted by the American Association of Community and Junior Colleges and funded by the National Science Foundation to explore the potential roles that community and junior colleges can play in the development of appropriate technologies. The participants included community college faculty and administrators, appropriate technology activists, and representatives from AACJC and NSF.

There was quick agreement on the notion that community colleges do have a role to play. In fact, as one participant put it, "Perhaps a community college is an appropriate technology." The community college representatives, many of whom had first-hand experience with AT programs in their own institutions, were uniformly enthusiastic about increased involvement of community colleges in AT. They cited many benefits to their own institutions as well as to their student bodies and communities.

They also strongly endorsed the recommendations contained in a previously distributed background paper, "Appropriate Technology and Community Colleges." Briefly cited below are some of the major themes and specific recommendations that emerged during the discussions.

I. THE ROLE OF COMMUNITY AND JUNIOR COLLEGES IN AT DEVELOPMENT

A. Background

A "market" does exist for AT programs. Many participants cited a ready and growing response to their AT offerings. The program at Cabrillo College started with a single course and has expanded now to 14 courses within a relatively short time. In addition to recent high school graduates seeking job skills and a degree, a growing segment of the student population is comprised of somewhat older students seeking competencies. At Washtenaw Community College last year less than 20% of the student body had graduated from high school in the previous year and the "average" student was 28 years old and taking just two courses. Many of these students are looking for skills and techniques that will help them fight the rising cost of living and put their free time to more productive use. AT-type offerings seem a natural for this growing market.

Colleges should place a heavy emphasis on networking, community development, establishing linkages and launching cooperative ventures with other community institutions. In addition to being in the spirit of the AT ethic, such an approach makes the best use of scarce resources, builds a solid and lasting community base, ensures local relevance, and aids in student recruitment.

There are also financial benefits to be gained by instituting AT programs. As one participant said, "If you teach self-reliance you become self-reliant." This can happen either by selling the goods or services that are often produced in AT courses and using the proceeds to defray program costs and/or by utilizing them in the college's own operations thereby reducing institutional operating costs.

There are two strategies for launching AT programs. The first, characterized as the "add-on" approach involves tacking on individual courses or projects wherever there is a need or opportunity. The second, or "institutional" approach entails a far more systematic effort involving the entire college and the local community. The first approach is probably called for in those cases where broad-based support, resources, and experience are initially lacking.

However, if the support is there then a college might consider a more extensive effort in the areas of:

(1) Administrative development; e.g., creation and/or modification of appropriate management structures, practices, and policies; faculty recruitment and retraining; and institutional priority setting;

(2) Curriculum development, e.g., development of individual courses, multi-year sequences and comprehensive, integrated programs; and

(3) Community development, e.g., conducting community needs and resource assessments; hosting community forums; creation of citizen advisory committees.

Each of the above should also include an evaluation and feedback component so that all involved parties are continually apprised of the program's emerging strengths and weaknesses.

B. Recommendations

Some specific actions that a college might consider include:

- Participation in a national information exchange on appropriate technology.
- Creating an AT Resource Center for use by local residents and/or students and faculty.
- Providing interested faculty with release time, facilities and/or financial support to develop AT courses or programs.
- Conducting a needs assessment of the campus itself, e.g., an energy audit, renewable resource inventory, waste disposal analysis, review of procurement policies.
- Publicizing availability of appropriate equipment, libraries, media, labs, etc., to community residents.
- Contacting and holding exploratory meetings with local AT groups to consider possible joint ventures.
- Surveying students, faculty and residents to determine nature and extent of interest in AT subjects.

II. THE ROLE OF AACJC IN AT DEVELOPMENT

The American Association of Community and Junior Colleges is in a unique position to take the lead in promoting AT in the nation's community and junior colleges. Its mission, stature, experience and outreach capabilities are all consonant with such a role. The participants strongly encouraged the Association leadership to take an active part in assisting local colleges in their efforts

by serving as a national facilitator, clearinghouse and catalyst.

Some specific suggestions for AACJC included the following:

- Compiling, printing and distributing a compendium of model, on-going community college AT programs with special emphasis on costs and benefits, program history, and involvement of minorities and women.
- Distributing roundtable reports to community college presidents and AT journals.
- Adding an AT component to the existing AACJC/NSHRC Community Resource Center Program.
- Funding a "circuit rider" to visit and network among colleges.
- Creating a media resource library to assemble, catalogue and circulate both print and non-print materials that would be of use to campuses developing AT programs.
- Compiling, printing and distributing periodically a guide to potential AT funding sources; assisting colleges in proposal preparation; securing funds for re-granting to individual colleges.
- Hosting a national conference for college presidents and faculty; legitimizing and encouraging institutional experimentation in AT.
- Working collaboratively with existing national and regional AT organizations and networks.
- Producing reports on AT and economic development.

III. THE ROLE OF NSF IN AT DEVELOPMENT

The participants were very supportive of NSF's interest in supporting AT work in junior and community colleges. While they felt it was imperative for colleges to commit their own resources to such efforts to the extent possible, they recognized that some

outside financial assistance would be necessary in many cases. However, being aware that most NSF programs were geared to four-year institutions, graduate schools and research establishments, they were concerned about NSF's ability to develop a program that was appropriate to their own unique needs, constraints and potentialities. On the whole they were guardedly optimistic and offered some of the following suggestions:

- Get input from community college personnel on program guidelines, funding criteria and proposal review.
- Describe fundable projects and topics as clearly as possible; provide technical assistance to potential applicants; distribute samples of successful proposals.
- Establish a continuing relationship with AACJC.
- Recognize that research should be regionally relevant and an integral part of curriculum development.
- Consider funding a journal on the technical and scientific aspects of AT, with an emphasis on knowledge sharing, data retrieval, problem solving and networking, features which would supplement the modest technical resources of most community colleges.
- Provide support for curriculum development--spread around from college to college.

IV. THE ROLE OF OTHER FEDERAL AGENCIES IN AT DEVELOPMENT

The participants clearly felt that other, mission-oriented agencies also had a responsibility to support the development of AT. Some specific recommendations included:

- Looking at the life-cycle costs of new structures and technologies.
- Creation of linkages between community colleges and the Energy Extension Service, Cooperative Extension Service and Office of Emergency Preparedness.
- Conducting national and regional studies of projected job opportunities in AT fields.

SOME ADDITIONAL OBSERVATIONS

Roger Yarrington

Appropriate technology, as suggested in David Goldberg's report, seems to fit with community colleges in various ways. For one thing, "AT" is considered a "movement" much the same as the community college was just a few years ago. Appropriate technology tends to defy the established ways of doing things, just as community colleges do in higher education. Appropriate technology is community-based, which is a posture proudly acclaimed by community colleges. Like the community college concept, AT is characterized by flexibility, low cost, and local decision making.

Among the participants in the roundtable were representatives of a number of community colleges that were engaged in appropriate technology, education and service. But they had not made much of the fact. They were performing services that seemed naturally to fit into the rubric of community service.

And there are many other colleges across the country that are engaged in the development of appropriate technology without ever thinking of their programs in that light. Lincoln Land Community College in Illinois is engaged in numerous energy-saving projects. Colleges in Wyoming are involved in an energy extension service. Navarro College in Texas is training solar energy technicians--as are several other colleges. Charles County Community College in Maryland is trying to save the estuaries that culminate in Michener's Chesapeake Bay county.

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But one of the more interesting developments that has come to light in the aftermath of the great gas crisis of 1979 is in Kansas. Here, in the geographic center of the country, in the farm belt, Colby Community College has developed a program to promote development of pure alcohol as an alternative fuel--an appropriate technology--using local grain to power local farm and ranch machinery. The process will be a touchstone for community development--as well as a means of insuring agricultural productivity and initiative on the part of the people.

As a footnote to the Colby development, it should be noted that the Department of Energy is offering grants for similar educational programs in alcohol fuel development with Colby's program as a model. This speaks to a recommendation of the roundtable--that various governmental agencies can help to contribute to community college service in appropriate technology.

The point is this: Community colleges not only have the potential to advance appropriate technology, they are already in it. They have experience to bring to the development of the "AT movement." The possibilities for expansion of local self-reliance through applied technology are limitless.

The recommendations of the roundtable suggest also that AACJC, as well as major government departments including NSF, can make contributions to the advancement of appropriate technology at the community college level. AACJC demonstrated its willingness and interest by responding to the need for an inquiry via the roundtable.

The Association will explore with its members the "appropriateness" of appropriate technology education and service through continued contact with the National Science Foundation and other agencies as programs are developed. AACJC, in fact, already has two national efforts in place which relate to the development of alternative technologies and the fostering of better public understanding of new needs and concerns about improving the quality of life in America.

AACJC has established a national energy information center with financial assistance from the Department of Energy. It will help member colleges in creating curriculums and providing other services. At the same time, the Association is developing forums on "Energy and the Way We Live" via the national network of community colleges. DOE and the National Endowment for the Humanities are supporting the forum project. Obviously, appropriate technology will be addressed in these activities.

These programs demonstrate the capability of the Association to interact with government agencies. The recent gas crisis, which was at its height during the time of the roundtable, is only one of many manifestations of changes to come in the way Americans live. It was sudden and dramatic. It demonstrated that citizens and institutions must use technology more creatively.

Community colleges obviously have a role in helping citizens cope with the changes that are coming.

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